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Earth Observations to address Earth's Environment and Climate Challenges (7)

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EVALUATION OF THE IMPACT OF ILLEGAL MINING ON VEGETATION IN THE VENEZUELAN
AMAZON THROUGH MULTISPECTRAL IMAGERY

Abstract

Illegal mining in the Venezuelan Amazon has proliferated in the last decade, due to multiple socio-economic factors. In 2016 a 111,843 km² region named *the Arco Miner del Orinoco (Orinoco Mining Arch)* was unlocked by the

The study is focused on the Cerro Yapacana mine site, located in the state of Amazonas, Venezuela, where illegal gold mining has taken place since the 1980's. Level-2 data from ESA's Sentinel-2 satellite is used to compute three vegetation indices: Normalized Difference Vegetation Index (NDVI), Red Edge Position (REP) and Normalized Pigment Chlorophyll Index (NPCl). The spatial changes of these indices are examined visually through the application of index masks, as well as graphically through longitudinal and latitudinal slices of the raster data. Changes over time of the indices are examined in the period 2020 – 2023. Preliminary results show an overall decrease in the value of NDVI between 2020 and 2023 when compared over equivalent latitudes, suggesting a drop in the chlorophyll production capability of the vegetation surrounding the mine site. Additionally, the data demonstrates how elevation variations can be used to identify regions of higher vegetation contamination risk, due to drainage gradient. The next phase of the investigation will seek to compare vegetation health between sections in the vicinity of the selected mine site, and a control location not in proximity of a mine.